

## SEQUENCE LISTING

<110> Mohler, Kendall  
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 Peschon, Jacques  
 Kennedy, Mary  
 Pluenneke, John

<120> METHODS FOR TREATING AUTOIMMUNE AND CHRONIC INFLAMMATORY CONDITIONS  
 USING ANTAGONISTS OF CD30 OR CD30-L

<130> 2959-A

<140> --to be assigned--

<141> 2001-08-03

<150> 60/224,079

<151> 2000-08-08

<160> 16

<170> PatentIn version 3.1

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| atg | gac | cca | ggg | ctg | cag | caa | gca | ctc | aac | gga | atg | gcc | cct | cct | gga | 48 |
| Met | Asp | Pro | Gly | Leu | Gln | Gln | Ala | Leu | Asn | Gly | Met | Ala | Pro | Pro | Gly |    |
| 1   |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |     |    |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| gac | aca | gcc | atg | cat | gtg | ccg | gcg | ggc | tcc | gtg | gcc | agc | cac | ctg | ggg | 96 |
| Asp | Thr | Ala | Met | His | Val | Pro | Ala | Gly | Ser | Val | Ala | Ser | His | Leu | Gly |    |
|     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |     |    |

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| acc | acg | agc | cgc | agc | tat | ttc | tat | ttg | acc | aca | gcc | act | ctg | gct | ctg | 144 |
| Thr | Thr | Ser | Arg | Ser | Tyr | Phe | Tyr | Leu | Thr | Thr | Ala | Thr | Leu | Ala | Leu |     |
|     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |     |

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| tgc | ctt | gtc | ttc | acg | gtg | gcc | act | att | atg | gtg | ttg | gtc | gtt | cag | agg | 192 |
| Cys | Leu | Val | Phe | Thr | Val | Ala | Thr | Ile | Met | Val | Leu | Val | Val | Gln | Arg |     |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |     |

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| acg | gac | tcc | att | ccc | aac | tca | cct | gac | aac | gtc | ccc | ctc | aaa | gga | gga | 240 |
| Thr | Asp | Ser | Ile | Pro | Asn | Ser | Pro | Asp | Asn | Val | Pro | Leu | Lys | Gly | Gly |     |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |     |

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| aat | tgc | tca | gaa | gac | ctc | tta | tgt | atc | ctg | aaa | aga | gct | cca | ttc | aag | 288 |
| Asn | Cys | Ser | Glu | Asp | Leu | Leu | Cys | Ile | Leu | Lys | Arg | Ala | Pro | Phe | Lys |     |



Cys Leu Val Phe Thr Val Ala Thr Ile Met Val Leu Val Val Gln Arg  
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Thr Asp Ser Ile Pro Asn Ser Pro Asp Asn Val Pro Leu Lys Gly Gly  
 65 70 75 80

Asn Cys Ser Glu Asp Leu Leu Cys Ile Leu Lys Arg Ala Pro Phe Lys  
 85 90 95

Lys Ser Trp Ala Tyr Leu Gln Val Ala Lys His Leu Asn Lys Thr Lys  
 100 105 110

Leu Ser Trp Asn Lys Asp Gly Ile Leu His Gly Val Arg Tyr Gln Asp  
 115 120 125

Gly Asn Leu Val Ile Gln Phe Pro Gly Leu Tyr Phe Ile Ile Cys Gln  
 130 135 140

Leu Gln Phe Leu Val Gln Cys Pro Asn Asn Ser Val Asp Leu Lys Leu  
 145 150 155 160

Glu Leu Leu Ile Asn Lys His Ile Lys Lys Gln Ala Leu Val Thr Val  
 165 170 175

Cys Glu Ser Gly Met Gln Thr Lys His Val Tyr Gln Asn Leu Ser Gln  
 180 185 190

Phe Leu Leu Asp Tyr Leu Gln Val Asn Thr Thr Ile Ser Val Asn Val  
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Asp Thr Phe Gln Tyr Ile Asp Thr Ser Thr Phe Pro Leu Glu Asn Val  
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Leu Ser Ile Phe Leu Tyr Ser Asn Ser Asp  
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| gac cca gcc atg cag gtg cag ccc ggc tcg gta gcc agc ccc tgg aga | 96  |
| Asp Pro Ala Met Gln Val Gln Pro Gly Ser Val Ala Ser Pro Trp Arg |     |
| 20 25 30  |     |
| agc acg agg ccc tgg aga agc aca agt cgc agc tac ttc tac ctc agc | 144 |
| Ser Thr Arg Pro Trp Arg Ser Thr Ser Arg Ser Tyr Phe Tyr Leu Ser |     |
| 35 40 45  |     |
| acc acc gca ctg gtg tgc ctt gtt gtg gca gtg gcg atc att ctg gta | 192 |
| Thr Thr Ala Leu Val Cys Leu Val Val Ala Val Ala Ile Ile Leu Val |     |
| 50 55 60  |     |
| ctg gta gtc cag aaa aag gac tcc act cca aat aca act gag aag gcc | 240 |
| Leu Val Val Gln Lys Lys Asp Ser Thr Pro Asn Thr Thr Glu Lys Ala |     |
| 65 70 75 80   |     |
| ccc ctt aaa gga gga aat tgc tca gag gat ctc ttc tgt acc ctg aaa | 288 |
| Pro Leu Lys Gly Gly Asn Cys Ser Glu Asp Leu Phe Cys Thr Leu Lys |     |
| 85 90 95  |     |
| agt act cca tcc aag aag tca tgg gcc tac ctc caa gtg tca aag cat | 336 |
| Ser Thr Pro Ser Lys Lys Ser Trp Ala Tyr Leu Gln Val Ser Lys His |     |
| 100 105 110   |     |
| ctc aac aat acc aaa ctg tca tgg aac gaa gat ggc acc atc cac gga | 384 |
| Leu Asn Asn Thr Lys Leu Ser Trp Asn Glu Asp Gly Thr Ile His Gly |     |
| 115 120 125   |     |
| ctc ata tac cag gac ggg aac ctg ata gtc caa ttc cct ggc ttg tac | 432 |
| Leu Ile Tyr Gln Asp Gly Asn Leu Ile Val Gln Phe Pro Gly Leu Tyr |     |
| 130 135 140   |     |
| ttc atc gtt tgc caa ctg cag ttc ctc gtg cag tgc tca aat cat tct | 480 |
| Phe Ile Val Cys Gln Leu Gln Phe Leu Val Gln Cys Ser Asn His Ser |     |
| 145 150 155 160   |     |
| gtg gac ctg aca ttg cag ctc ctc atc aat tcc aag atc aaa aag cag | 528 |
| Val Asp Leu Thr Leu Gln Leu Leu Ile Asn Ser Lys Ile Lys Lys Gln |     |
| 165 170 175   |     |
| acg ttg gta aca gtg tgt gag tct gga gtt cag agt aag aac atc tac | 576 |
| Thr Leu Val Thr Val Cys Glu Ser Gly Val Gln Ser Lys Asn Ile Tyr |     |
| 180 185 190   |     |
| cag aat ctc tct cag ttt ttg ctg cat tac tta cag gtc aac tct acc | 624 |
| Gln Asn Leu Ser Gln Phe Leu Leu His Tyr Leu Gln Val Asn Ser Thr |     |
| 195 200 205   |     |
| ata tca gtc agg gtg gat aat ttc cag tat gtg gat aca aac act ttc | 672 |

Ile Ser Val Arg Val Asp Asn Phe Gln Tyr Val Asp Thr Asn Thr Phe  
 210 215 220

cct ctt gat aat gtg cta tcc gtc ttc tta tat agt agc tca gac tga 720  
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Ser Thr Arg Pro Trp Arg Ser Thr Ser Arg Ser Tyr Phe Tyr Leu Ser  
 35 40 45

Thr Thr Ala Leu Val Cys Leu Val Val Ala Val Ala Ile Ile Leu Val  
 50 55 60

Leu Val Val Gln Lys Lys Asp Ser Thr Pro Asn Thr Thr Glu Lys Ala  
 65 70 75 80

Pro Leu Lys Gly Gly Asn Cys Ser Glu Asp Leu Phe Cys Thr Leu Lys  
 85 90 95

Ser Thr Pro Ser Lys Lys Ser Trp Ala Tyr Leu Gln Val Ser Lys His  
 100 105 110

Leu Asn Asn Thr Lys Leu Ser Trp Asn Glu Asp Gly Thr Ile His Gly  
 115 120 125

Leu Ile Tyr Gln Asp Gly Asn Leu Ile Val Gln Phe Pro Gly Leu Tyr  
 130 135 140

Phe Ile Val Cys Gln Leu Gln Phe Leu Val Gln Cys Ser Asn His Ser  
 145 150 155 160

Val Asp Leu Thr Leu Gln Leu Leu Ile Asn Ser Lys Ile Lys Lys Gln  
 165 170 175

Thr Leu Val Thr Val Cys Glu Ser Gly Val Gln Ser Lys Asn Ile Tyr  
180 185 190

Gln Asn Leu Ser Gln Phe Leu Leu His Tyr Leu Gln Val Asn Ser Thr  
195 200 205

Ile Ser Val Arg Val Asp Asn Phe Gln Tyr Val Asp Thr Asn Thr Phe  
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cga gcc ttc cca cag gat cga ccc ttc gag gac acc tgt cat gga aac 96  
Arg Ala Phe Pro Gln Asp Arg Pro Phe Glu Asp Thr Cys His Gly Asn  
20 25 30  
ccc agc cac tac tat gac aag gct gtc agg agg tgc tgt tac cgc tgc 144  
Pro Ser His Tyr Tyr Asp Lys Ala Val Arg Arg Cys Cys Tyr Arg Cys  
35 40 45  
ccc atg ggg ctg ttc ccg aca cag cag tgc cca cag agg cct act gac 192  
Pro Met Gly Leu Phe Pro Thr Gln Gln Cys Pro Gln Arg Pro Thr Asp  
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tgc agg aag cag tgt gag cct gac tac tac ctg gat gag gcc gac cgc 240  
Cys Arg Lys Gln Cys Glu Pro Asp Tyr Tyr Leu Asp Glu Ala Asp Arg  
65 70 75 80  
tgt aca gcc tgc gtg act tgt tct cga gat gac ctc gtg gag aag acg 288  
Cys Thr Ala Cys Val Thr Cys Ser Arg Asp Asp Leu Val Glu Lys Thr  
85 90 95  
ccg tgt gca tgg aac tcc tcc cgt gtc tgc gaa tgt cga ccc ggc atg 336  
Pro Cys Ala Trp Asn Ser Ser Arg Val Cys Glu Cys Arg Pro Gly Met  
100 105 110

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|---|------|
| ttc tgt tcc acg tct gcc gtc aac tcc tgt gcc cgc tgc ttc ttc cat | 384  |
| Phe Cys Ser Thr Ser Ala Val Asn Ser Cys Ala Arg Cys Phe Phe His |      |
| 115 120 125   |      |
| tct gtc tgt ccg gca ggg atg att gtc aag ttc cca ggc acg gcg cag | 432  |
| Ser Val Cys Pro Ala Gly Met Ile Val Lys Phe Pro Gly Thr Ala Gln |      |
| 130 135 140   |      |
| aag aac acg gtc tgt gag ccg gct tcc cca ggg gtc agc cct gcc tgt | 480  |
| Lys Asn Thr Val Cys Glu Pro Ala Ser Pro Gly Val Ser Pro Ala Cys |      |
| 145 150 155 160   |      |
| gcc agc cca gag aac tgc aag gaa ccc tcc agt ggc acc atc ccc cag | 528  |
| Ala Ser Pro Glu Asn Cys Lys Glu Pro Ser Ser Gly Thr Ile Pro Gln |      |
| 165 170 175   |      |
| gcc aag ccc acc ccg gtg tcc cca gca acc tcc agt gcc agc acc atg | 576  |
| Ala Lys Pro Thr Pro Val Ser Pro Ala Thr Ser Ser Ala Ser Thr Met |      |
| 180 185 190   |      |
| cct gta aga ggg ggc acc cgc ctc gcc cag gaa gct gct tct aaa ctg | 624  |
| Pro Val Arg Gly Gly Thr Arg Leu Ala Gln Glu Ala Ser Lys Leu     |      |
| 195 200 205   |      |
| acg agg gct ccc gac tct ccc tcc tct gtg gga agg cct agt tca gat | 672  |
| Thr Arg Ala Pro Asp Ser Pro Ser Ser Val Gly Arg Pro Ser Ser Asp |      |
| 210 215 220   |      |
| cca ggt ctg tcc cca aca cag cca tgc cca gag ggg tct ggt gat tgc | 720  |
| Pro Gly Leu Ser Pro Thr Gln Pro Cys Pro Glu Gly Ser Gly Asp Cys |      |
| 225 230 235 240   |      |
| aga aag cag tgt gag ccc gac tac tac ctg gac gag gcc ggc cgc tgc | 768  |
| Arg Lys Gln Cys Glu Pro Asp Tyr Tyr Leu Asp Glu Ala Gly Arg Cys |      |
| 245 250 255   |      |
| aca gcc tgc gtg agc tgt tct cga gat gac ctt gtg gag aag acg cca | 816  |
| Thr Ala Cys Val Ser Cys Ser Arg Asp Asp Leu Val Glu Lys Thr Pro |      |
| 260 265 270   |      |
| tgt gca tgg aac tcc tcc cgc acc tgc gaa tgt cga cct ggc atg atc | 864  |
| Cys Ala Trp Asn Ser Ser Arg Thr Cys Glu Cys Arg Pro Gly Met Ile |      |
| 275 280 285   |      |
| tgt gcc aca tca gcc acc aac tcc tgt gcc cgc tgt gtc ccc tac cca | 912  |
| Cys Ala Thr Ser Ala Thr Asn Ser Cys Ala Arg Cys Val Pro Tyr Pro |      |
| 290 295 300   |      |
| atc tgt gca gga gag acg gtc acc aag ccc cag gat atg gct gag aag | 960  |
| Ile Cys Ala Gly Glu Thr Val Thr Lys Pro Gln Asp Met Ala Glu Lys |      |
| 305 310 315 320   |      |
| gac acc acc ttt gag gcg cca ccc ctg ggg acc cag ccg gac tgc aac | 1008 |
| Asp Thr Thr Phe Glu Ala Pro Pro Leu Gly Thr Gln Pro Asp Cys Asn |      |
| 325 330 335   |      |

|   |      |
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| ccc acc cca gag aat ggc gag gcg cct gcc agc acc agc ccc act cag | 1056 |
| Pro Thr Pro Glu Asn Gly Glu Ala Pro Ala Ser Thr Ser Pro Thr Gln |      |
| 340 345 350   |      |
| agc ttg ctg gtg gac tcc cag gcc agt aag acg ctg ccc atc cca acc | 1104 |
| Ser Leu Leu Val Asp Ser Gln Ala Ser Lys Thr Leu Pro Ile Pro Thr |      |
| 355 360 365   |      |
| agc gct ccc gtc gct ctc tcc tcc acg ggg aag ccc gtt ctg gat gca | 1152 |
| Ser Ala Pro Val Ala Leu Ser Ser Thr Gly Lys Pro Val Leu Asp Ala |      |
| 370 375 380   |      |
| ggg cca gtg ctc ttc tgg gtg atc ctg gtg ttg gtt gtg gtg gtc ggc | 1200 |
| Gly Pro Val Leu Phe Trp Val Ile Leu Val Leu Val Val Val Val Gly |      |
| 385 390 395 400   |      |
| tcc agc gcc ttc ctc ctg tgc cac cgg agg gcc tgc agg aag cga att | 1248 |
| Ser Ser Ala Phe Leu Leu Cys His Arg Arg Ala Cys Arg Lys Arg Ile |      |
| 405 410 415   |      |
| cgg cag aag ctc cac ctg tgc tac ccg gtc cag acc tcc cag ccc aag | 1296 |
| Arg Gln Lys Leu His Leu Cys Tyr Pro Val Gln Thr Ser Gln Pro Lys |      |
| 420 425 430   |      |
| cta gag ctt gtg gat tcc aga ccc agg agg agc tca acg cag ctg agg | 1344 |
| Leu Glu Leu Val Asp Ser Arg Pro Arg Arg Ser Ser Thr Gln Leu Arg |      |
| 435 440 445   |      |
| agt ggt gcg tcg gtg aca gaa ccc gtc gcg gaa gag cga ggg tta atg | 1392 |
| Ser Gly Ala Ser Val Thr Glu Pro Val Ala Glu Glu Arg Gly Leu Met |      |
| 450 455 460   |      |
| agc cag cca ctg atg gag acc tgc cac agc gtg ggg gca gcc tac ctg | 1440 |
| Ser Gln Pro Leu Met Glu Thr Cys His Ser Val Gly Ala Ala Tyr Leu |      |
| 465 470 475 480   |      |
| gag agc ctg ccg ctg cag gat gcc agc ccg gcc ggg ggc ccc tcg tcc | 1488 |
| Glu Ser Leu Pro Leu Gln Asp Ala Ser Pro Ala Gly Gly Pro Ser Ser |      |
| 485 490 495   |      |
| ccc agg gac ctt cct gag ccc cgg gtg tcc acg gag cac acc aat aac | 1536 |
| Pro Arg Asp Leu Pro Glu Pro Arg Val Ser Thr Glu His Thr Asn Asn |      |
| 500 505 510   |      |
| aag att gag aaa atc tac atc atg aag gct gac acc gtg atc gtg ggg | 1584 |
| Lys Ile Glu Lys Ile Tyr Ile Met Lys Ala Asp Thr Val Ile Val Gly |      |
| 515 520 525   |      |
| acc gtg aag gct gag ctg ccg gag ggc cgg ggc ctg gcg ggg cca gca | 1632 |
| Thr Val Lys Ala Glu Leu Pro Glu Gly Arg Gly Leu Ala Gly Pro Ala |      |
| 530 535 540   |      |
| gag ccc gag ttg gag gag gag ctg gag gcg gac cat acc ccc cac tac | 1680 |
| Glu Pro Glu Leu Glu Glu Glu Leu Glu Ala Asp His Thr Pro His Tyr |      |
| 545 550 555 560   |      |
| ccc gag cag gag aca gaa ccg cct ctg ggc agc tgc agc gat gtc atg | 1728 |



Pro Glu Gln Glu Thr Glu Pro Pro Leu Gly Ser Cys Ser Asp Val Met  
565 570 575

ctc tca gtg gaa gag gaa ggg aaa gaa gac ccc ttg ccc aca gct gcc 1776  
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Pro Ser His Tyr Tyr Asp Lys Ala Val Arg Arg Cys Cys Tyr Arg Cys  
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Pro Met Gly Leu Phe Pro Thr Gln Gln Cys Pro Gln Arg Pro Thr Asp  
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Cys Arg Lys Gln Cys Glu Pro Asp Tyr Tyr Leu Asp Glu Ala Asp Arg  
65 70 75 80

Cys Thr Ala Cys Val Thr Cys Ser Arg Asp Asp Leu Val Glu Lys Thr  
85 90 95

Pro Cys Ala Trp Asn Ser Ser Arg Val Cys Glu Cys Arg Pro Gly Met  
100 105 110

Phe Cys Ser Thr Ser Ala Val Asn Ser Cys Ala Arg Cys Phe Phe His  
115 120 125

Ser Val Cys Pro Ala Gly Met Ile Val Lys Phe Pro Gly Thr Ala Gln  
130 135 140

Lys Asn Thr Val Cys Glu Pro Ala Ser Pro Gly Val Ser Pro Ala Cys  
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Ala Ser Pro Glu Asn Cys Lys Glu Pro Ser Ser Gly Thr Ile Pro Gln  
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Ala Lys Pro Thr Pro Val Ser Pro Ala Thr Ser Ser Ala Ser Thr Met  
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Pro Val Arg Gly Gly Thr Arg Leu Ala Gln Glu Ala Ala Ser Lys Leu  
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Thr Arg Ala Pro Asp Ser Pro Ser Ser Val Gly Arg Pro Ser Ser Asp  
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Pro Gly Leu Ser Pro Thr Gln Pro Cys Pro Glu Gly Ser Gly Asp Cys  
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Arg Lys Gln Cys Glu Pro Asp Tyr Tyr Leu Asp Glu Ala Gly Arg Cys  
 245 250 255

Thr Ala Cys Val Ser Cys Ser Arg Asp Asp Leu Val Glu Lys Thr Pro  
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Cys Ala Trp Asn Ser Ser Arg Thr Cys Glu Cys Arg Pro Gly Met Ile  
 275 280 285

Cys Ala Thr Ser Ala Thr Asn Ser Cys Ala Arg Cys Val Pro Tyr Pro  
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Ile Cys Ala Gly Glu Thr Val Thr Lys Pro Gln Asp Met Ala Glu Lys  
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Asp Thr Thr Phe Glu Ala Pro Pro Leu Gly Thr Gln Pro Asp Cys Asn  
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Pro Thr Pro Glu Asn Gly Glu Ala Pro Ala Ser Thr Ser Pro Thr Gln  
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Ser Leu Leu Val Asp Ser Gln Ala Ser Lys Thr Leu Pro Ile Pro Thr  
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Ser Ala Pro Val Ala Leu Ser Ser Thr Gly Lys Pro Val Leu Asp Ala  
 370 375 380

Gly Pro Val Leu Phe Trp Val Ile Leu Val Leu Val Val Val Val Gly  
 385 390 395 400

Ser Ser Ala Phe Leu Leu Cys His Arg Arg Ala Cys Arg Lys Arg Ile  
 405 410 415

Arg Gln Lys Leu His Leu Cys Tyr Pro Val Gln Thr Ser Gln Pro Lys  
 420 425 430

Leu Glu Leu Val Asp Ser Arg Pro Arg Arg Ser Ser Thr Gln Leu Arg  
 435 440 445

Ser Gly Ala Ser Val Thr Glu Pro Val Ala Glu Glu Arg Gly Leu Met  
 450 455 460

Ser Gln Pro Leu Met Glu Thr Cys His Ser Val Gly Ala Ala Tyr Leu  
 465 470 475 480

Glu Ser Leu Pro Leu Gln Asp Ala Ser Pro Ala Gly Gly Pro Ser Ser  
 485 490 495

Pro Arg Asp Leu Pro Glu Pro Arg Val Ser Thr Glu His Thr Asn Asn  
 500 505 510

Lys Ile Glu Lys Ile Tyr Ile Met Lys Ala Asp Thr Val Ile Val Gly  
 515 520 525

Thr Val Lys Ala Glu Leu Pro Glu Gly Arg Gly Leu Ala Gly Pro Ala  
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Glu Pro Glu Leu Glu Glu Glu Leu Glu Ala Asp His Thr Pro His Tyr  
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Ser Gly Lys  
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 Met Leu Arg Leu Tyr Val Leu  
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 Val Met Gly Val Ser Ala Phe Thr Leu Gln Pro Ala Ala His Thr Gly  
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 Ala Ala Arg Ser Cys Arg Phe Arg Gly Arg His Tyr Lys Arg Glu Phe  
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 agg ctg gaa ggg gag cct gta gcc ctg agg tgc ccc cag gtg ccc tac 318  
 Arg Leu Glu Gly Glu Pro Val Ala Leu Arg Cys Pro Gln Val Pro Tyr  
 30 35 40  
 tgg ttg tgg gcc tct gtc agc ccc cgc atc aac ctg aca tgg cat aaa 366  
 Trp Leu Trp Ala Ser Val Ser Pro Arg Ile Asn Leu Thr Trp His Lys  
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 aat gac tct gct agg acg gtc cca gga gaa gaa gag aca cgg atg tgg 414  
 Asn Asp Ser Ala Arg Thr Val Pro Gly Glu Glu Glu Thr Arg Met Trp  
 60 65 70  
 gcc cag gac ggt gct ctg tgg ctt ctg cca gcc ttg cag gag gac tct 462  
 Ala Gln Asp Gly Ala Leu Trp Leu Leu Pro Ala Leu Gln Glu Asp Ser  
 75 80 85 90  
 ggc acc tac gtc tgc act act aga aat gct tct tac tgt gac aaa atg 510

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Gly | Thr | Tyr | Val | Cys | Thr | Thr | Arg | Asn | Ala | Ser | Tyr | Cys | Asp | Lys | Met |      |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |     |      |
| tcc | att | gag | ctc | aga | gtt | ttt | gag | aat | aca | gat | gct | ttc | ctg | ccg | ttc | 558  |
| Ser | Ile | Glu | Leu | Arg | Val | Phe | Glu | Asn | Thr | Asp | Ala | Phe | Leu | Pro | Phe |      |
|     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |     |     |      |
| atc | tca | tac | ccg | caa | att | tta | acc | ttg | tca | acc | tct | ggg | gta | tta | gta | 606  |
| Ile | Ser | Tyr | Pro | Gln | Ile | Leu | Thr | Leu | Ser | Thr | Ser | Gly | Val | Leu | Val |      |
|     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |     |     |     |      |
| tgc | cct | gac | ctg | agt | gaa | ttc | acc | cgt | gac | aaa | act | gac | gtg | aag | att | 654  |
| Cys | Pro | Asp | Leu | Ser | Glu | Phe | Thr | Arg | Asp | Lys | Thr | Asp | Val | Lys | Ile |      |
|     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |     |     |     |     |      |
| caa | tgg | tac | aag | gat | tct | ctt | ctt | ttg | gat | aaa | gac | aat | gag | aaa | ttt | 702  |
| Gln | Trp | Tyr | Lys | Asp | Ser | Leu | Leu | Leu | Asp | Lys | Asp | Asn | Glu | Lys | Phe |      |
| 155 |     |     |     |     | 160 |     |     |     |     | 165 |     |     |     |     | 170 |      |
| cta | agt | gtg | agg | ggg | acc | act | cac | tta | ctc | gta | cac | gat | gtg | gcc | ctg | 750  |
| Leu | Ser | Val | Arg | Gly | Thr | Thr | His | Leu | Leu | Val | His | Asp | Val | Ala | Leu |      |
|     |     |     |     | 175 |     |     |     |     | 180 |     |     |     |     | 185 |     |      |
| gaa | gat | gct | ggc | tat | tac | cgc | tgt | gtc | ctg | aca | ttt | gcc | cat | gaa | ggc | 798  |
| Glu | Asp | Ala | Gly | Tyr | Tyr | Arg | Cys | Val | Leu | Thr | Phe | Ala | His | Glu | Gly |      |
|     |     |     | 190 |     |     |     |     | 195 |     |     |     |     | 200 |     |     |      |
| cag | caa | tac | aac | atc | act | agg | agt | att | gag | cta | cgc | atc | aag | aaa | aaa | 846  |
| Gln | Gln | Tyr | Asn | Ile | Thr | Arg | Ser | Ile | Glu | Leu | Arg | Ile | Lys | Lys | Lys |      |
|     |     | 205 |     |     |     |     | 210 |     |     |     |     | 215 |     |     |     |      |
| aaa | gaa | gag | acc | att | cct | gtg | atc | att | tcc | ccc | ctc | aag | acc | ata | tca | 894  |
| Lys | Glu | Glu | Thr | Ile | Pro | Val | Ile | Ile | Ser | Pro | Leu | Lys | Thr | Ile | Ser |      |
|     | 220 |     |     |     |     | 225 |     |     |     |     | 230 |     |     |     |     |      |
| gct | tct | ctg | ggg | tca | aga | ctg | aca | atc | ccg | tgt | aag | gtg | ttt | ctg | gga | 942  |
| Ala | Ser | Leu | Gly | Ser | Arg | Leu | Thr | Ile | Pro | Cys | Lys | Val | Phe | Leu | Gly |      |
| 235 |     |     |     |     | 240 |     |     |     |     | 245 |     |     |     |     | 250 |      |
| acc | ggc | aca | ccc | tta | acc | acc | atg | ctg | tgg | tgg | acg | gcc | aat | gac | acc | 990  |
| Thr | Gly | Thr | Pro | Leu | Thr | Thr | Met | Leu | Trp | Trp | Thr | Ala | Asn | Asp | Thr |      |
|     |     |     |     | 255 |     |     |     |     | 260 |     |     |     |     | 265 |     |      |
| cac | ata | gag | agc | gcc | tac | ccg | gga | ggc | cgc | gtg | acc | gag | ggg | cca | cgc | 1038 |
| His | Ile | Glu | Ser | Ala | Tyr | Pro | Gly | Gly | Arg | Val | Thr | Glu | Gly | Pro | Arg |      |
|     |     |     | 270 |     |     |     |     | 275 |     |     |     |     | 280 |     |     |      |
| cag | gaa | tat | tca | gaa | aat | aat | gag | aac | tac | att | gaa | gtg | cca | ttg | att | 1086 |
| Gln | Glu | Tyr | Ser | Glu | Asn | Asn | Glu | Asn | Tyr | Ile | Glu | Val | Pro | Leu | Ile |      |
|     |     | 285 |     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |      |
| ttt | gat | cct | gtc | aca | aga | gag | gat | ttg | cac | atg | gat | ttt | aaa | tgt | gtt | 1134 |
| Phe | Asp | Pro | Val | Thr | Arg | Glu | Asp | Leu | His | Met | Asp | Phe | Lys | Cys | Val |      |
|     | 300 |     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     |      |
| gtc | cat | aat | acc | ctg | agt | ttt | cag | aca | cta | cgc | acc | aca | gtc | aag | gaa | 1182 |
| Val | His | Asn | Thr | Leu | Ser | Phe | Gln | Thr | Leu | Arg | Thr | Thr | Val | Lys | Glu |      |

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• 315          320          325          330

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Ala Ser Ser Thr Phe Ser Trp Gly Ile Val Leu Ala Pro Leu Ser Leu
          335          340          345

gcc ttc ttg gtt ttg ggg gga ata tgg atg cac aga cgg tgc aaa cac      1278
Ala Phe Leu Val Leu Gly Gly Ile Trp Met His Arg Arg Cys Lys His
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aga act gga aaa gca gat ggt ctg act gtg cta tgg cct cat cat caa      1326
Arg Thr Gly Lys Ala Asp Gly Leu Thr Val Leu Trp Pro His His Gln
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Asp Phe Gln Ser Tyr Pro Lys
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Arg His Tyr Lys Arg Glu Phe Arg Leu Glu Gly Glu Pro Val Ala Leu
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Arg Cys Pro Gln Val Pro Tyr Trp Leu Trp Ala Ser Val Ser Pro Arg
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Ile Asn Leu Thr Trp His Lys Asn Asp Ser Ala Arg Thr Val Pro Gly
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Glu Glu Glu Thr Arg Met Trp Ala Gln Asp Gly Ala Leu Trp Leu Leu
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Pro Ala Leu Gln Glu Asp Ser Gly Thr Tyr Val Cys Thr Thr Arg Asn
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Ala Ser Tyr Cys Asp Lys Met Ser Ile Glu Leu Arg Val Phe Glu Asn
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Thr Asp Ala Phe Leu Pro Phe Ile Ser Tyr Pro Gln Ile Leu Thr Leu  
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Asp Lys Asp Asn Glu Lys Phe Leu Ser Val Arg Gly Thr Thr His Leu  
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Leu Val His Asp Val Ala Leu Glu Asp Ala Gly Tyr Tyr Arg Cys Val  
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Leu Thr Phe Ala His Glu Gly Gln Gln Tyr Asn Ile Thr Arg Ser Ile  
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Glu Leu Arg Ile Lys Lys Lys Lys Glu Glu Thr Ile Pro Val Ile Ile  
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Ser Pro Leu Lys Thr Ile Ser Ala Ser Leu Gly Ser Arg Leu Thr Ile  
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Pro Cys Lys Val Phe Leu Gly Thr Gly Thr Pro Leu Thr Thr Met Leu  
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Trp Trp Thr Ala Asn Asp Thr His Ile Glu Ser Ala Tyr Pro Gly Gly  
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Arg Val Thr Glu Gly Pro Arg Gln Glu Tyr Ser Glu Asn Asn Glu Asn  
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Tyr Ile Glu Val Pro Leu Ile Phe Asp Pro Val Thr Arg Glu Asp Leu  
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His Met Asp Phe Lys Cys Val Val His Asn Thr Leu Ser Phe Gln Thr  
 310 315 320

Leu Arg Thr Thr Val Lys Glu Ala Ser Ser Thr Phe Ser Trp Gly Ile  
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Val Leu Ala Pro Leu Ser Leu Ala Phe Leu Val Leu Gly Gly Ile Trp  
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|   |     |
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| ggt ttt ctg ctc tcc gaa gcc cac acg tgt atc cct gag aac aac gga<br>Val Phe Leu Leu Ser Glu Ala His Thr Cys Ile Pro Glu Asn Asn Gly<br>40 45 50 55     | 240 |
| ggc gcg ggg tgc gtg tgc cac ctg ctc atg gat gac gtg gtc agt gcg<br>Gly Ala Gly Cys Val Cys His Leu Leu Met Asp Asp Val Val Ser Ala<br>60 65 70        | 288 |
| gat aac tat aca ctg gac ctg tgg gct ggg cag cag ctg ctg tgg aag<br>Asp Asn Tyr Thr Leu Asp Leu Trp Ala Gly Gln Gln Leu Leu Trp Lys<br>75 80 85        | 336 |
| ggc tcc ttc aag ccc agc gag cat gtg aaa ccc agg gcc cca gga aac<br>Gly Ser Phe Lys Pro Ser Glu His Val Lys Pro Arg Ala Pro Gly Asn<br>90 95 100       | 384 |
| ctg aca gtt cac acc aat gtc tcc gac act ctg ctg ctg acc tgg agc<br>Leu Thr Val His Thr Asn Val Ser Asp Thr Leu Leu Leu Thr Trp Ser<br>105 110 115     | 432 |
| aac ccg tat ccc cct gac aat tac ctg tat aat cat ctc acc tat gca<br>Asn Pro Tyr Pro Pro Asp Asn Tyr Leu Tyr Asn His Leu Thr Tyr Ala<br>120 125 130 135 | 480 |
| gtc aac att tgg agt gaa aac gac ccg gca gat ttc aga atc tat aac<br>Val Asn Ile Trp Ser Glu Asn Asp Pro Ala Asp Phe Arg Ile Tyr Asn<br>140 145 150     | 528 |
| gtg acc tac cta gaa ccc tcc ctc cgc atc gca gcc agc acc ctg aag<br>Val Thr Tyr Leu Glu Pro Ser Leu Arg Ile Ala Ala Ser Thr Leu Lys<br>155 160 165     | 576 |
| tct ggg att tcc tac agg gca cgg gtg agg gcc tgg gct cag tgc tat<br>Ser Gly Ile Ser Tyr Arg Ala Arg Val Arg Ala Trp Ala Gln Cys Tyr<br>170 175 180     | 624 |
| aac acc acc tgg agt gag tgg agc ccc agc acc aag tgg cac aac tcc<br>Asn Thr Thr Trp Ser Glu Trp Ser Pro Ser Thr Lys Trp His Asn Ser<br>185 190 195     | 672 |
| tac agg gag ccc ttc gag cag cac ctc ctg ctg gcc gtc agc gtt tcc<br>Tyr Arg Glu Pro Phe Glu Gln His Leu Leu Leu Gly Val Ser Val Ser<br>200 205 210 215 | 720 |
| tgc att gtc atc ctg gcc gtc tgc ctg ttg tgc tat gtc agc atc acc<br>Cys Ile Val Ile Leu Ala Val Cys Leu Leu Cys Tyr Val Ser Ile Thr<br>220 225 230     | 768 |
| aag att aag aaa gaa tgg tgg gat cag att ccc aac cca gcc cgc agc<br>Lys Ile Lys Lys Glu Trp Trp Asp Gln Ile Pro Asn Pro Ala Arg Ser<br>235 240 245     | 816 |
| cgc ctc gtg gct ata ata atc cag gat gct cag ggg tca cag tgg gag   | 864 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|------|
| Arg | Leu | Val | Ala | Ile | Ile | Ile | Gln | Asp | Ala | Gln | Gly | Ser | Gln | Trp | Glu |  |      |
| 250 |     |     |     |     |     |     | 255 |     |     |     |     | 260 |     |     |     |  |      |
| aag | cgg | tcc | cga | ggc | cag | gaa | cca | gcc | aag | tgc | cca | cac | tgg | aag | aat |  | 912  |
| Lys | Arg | Ser | Arg | Gly | Gln | Glu | Pro | Ala | Lys | Cys | Pro | His | Trp | Lys | Asn |  |      |
| 265 |     |     |     |     |     | 270 |     |     |     |     | 275 |     |     |     |     |  |      |
| tgt | ctt | acc | aag | ctc | ttg | ccc | tgt | ttt | ctg | gag | cac | aac | atg | aaa | agg |  | 960  |
| Cys | Leu | Thr | Lys | Leu | Leu | Pro | Cys | Phe | Leu | Glu | His | Asn | Met | Lys | Arg |  |      |
| 280 |     |     |     |     | 285 |     |     |     |     | 290 |     |     |     |     | 295 |  |      |
| gat | gaa | gat | cct | cac | aag | gct | gcc | aaa | gag | atg | cct | ttc | cag | ggc | tct |  | 1008 |
| Asp | Glu | Asp | Pro | His | Lys | Ala | Ala | Lys | Glu | Met | Pro | Phe | Gln | Gly | Ser |  |      |
|     |     |     |     | 300 |     |     |     |     | 305 |     |     |     |     | 310 |     |  |      |
| gga | aaa | tca | gca | tgg | tgc | cca | gtg | gag | atc | agc | aag | aca | gtc | ctc | tgg |  | 1056 |
| Gly | Lys | Ser | Ala | Trp | Cys | Pro | Val | Glu | Ile | Ser | Lys | Thr | Val | Leu | Trp |  |      |
|     |     |     | 315 |     |     |     |     | 320 |     |     |     |     | 325 |     |     |  |      |
| cca | gag | agc | atc | agc | gtg | gtg | cga | tgt | gtg | gag | ttg | ttt | gag | gcc | ccg |  | 1104 |
| Pro | Glu | Ser | Ile | Ser | Val | Val | Arg | Cys | Val | Glu | Leu | Phe | Glu | Ala | Pro |  |      |
|     |     |     | 330 |     |     |     | 335 |     |     |     |     |     | 340 |     |     |  |      |
| gtg | gag | tgt | gag | gag | gag | gag | gag | gta | gag | gaa | gaa | aaa | ggg | agc | ttc |  | 1152 |
| Val | Glu | Cys | Glu | Glu | Glu | Glu | Glu | Val | Glu | Glu | Glu | Lys | Gly | Ser | Phe |  |      |
|     | 345 |     |     |     |     | 350 |     |     |     |     |     | 355 |     |     |     |  |      |
| tgt | gca | tcg | cct | gag | agc | agc | agg | gat | gac | ttc | cag | gag | gga | agg | gag |  | 1200 |
| Cys | Ala | Ser | Pro | Glu | Ser | Ser | Arg | Asp | Asp | Phe | Gln | Glu | Gly | Arg | Glu |  |      |
| 360 |     |     |     |     | 365 |     |     |     | 370 |     |     |     |     |     | 375 |  |      |
| ggc | att | gtg | gcc | cgg | cta | aca | gag | agc | ctg | ttc | ctg | gac | ctg | ctc | gga |  | 1248 |
| Gly | Ile | Val | Ala | Arg | Leu | Thr | Glu | Ser | Leu | Phe | Leu | Asp | Leu | Leu | Gly |  |      |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |     |  |      |
| gag | gag | aat | ggg | ggc | ttt | tgc | cag | cag | gac | atg | ggg | gag | tca | tgc | ctt |  | 1296 |
| Glu | Glu | Asn | Gly | Gly | Phe | Cys | Gln | Gln | Asp | Met | Gly | Glu | Ser | Cys | Leu |  |      |
|     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |     |     |  |      |
| ctt | cca | cct | tcg | gga | agt | acg | agt | gct | cac | atg | ccc | tgg | gat | gag | ttc |  | 1344 |
| Leu | Pro | Pro | Ser | Gly | Ser | Thr | Ser | Ala | His | Met | Pro | Trp | Asp | Glu | Phe |  |      |
|     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |     |     |     |  |      |
| cca | agt | gca | ggg | ccc | aag | gag | gca | cct | ccc | tgg | ggc | aag | gag | cag | cct |  | 1392 |
| Pro | Ser | Ala | Gly | Pro | Lys | Glu | Ala | Pro | Pro | Trp | Gly | Lys | Glu | Gln | Pro |  |      |
|     |     | 425 |     |     |     | 430 |     |     |     |     | 435 |     |     |     |     |  |      |
| ctc | cac | ctg | gag | cca | agt | cct | cct | gcc | agc | ccg | acc | cag | agt | cca | gac |  | 1440 |
| Leu | His | Leu | Glu | Pro | Ser | Pro | Pro | Ala | Ser | Pro | Thr | Gln | Ser | Pro | Asp |  |      |
| 440 |     |     |     |     | 445 |     |     |     | 450 |     |     |     |     |     | 455 |  |      |
| aac | ctg | act | tgc | aca | gag | acg | ccc | ctc | gtc | atc | gca | ggc | aac | cct | gct |  | 1488 |
| Asn | Leu | Thr | Cys | Thr | Glu | Thr | Pro | Leu | Val | Ile | Ala | Gly | Asn | Pro | Ala |  |      |
|     |     |     |     | 460 |     |     |     | 465 |     |     |     |     | 470 |     |     |  |      |
| tac | cgc | agc | ttc | agc | aac | tcc | ctg | agc | cag | tca | ccg | tgt | ccc | aga | gag |  | 1536 |
| Tyr | Arg | Ser | Phe | Ser | Asn | Ser | Leu | Ser | Gln | Ser | Pro | Cys | Pro | Arg | Glu |  |      |

| 475   | 480 | 485 |      |
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| ctg ggt cca gac cca ctg ctg gcc aga cac ctg gag gaa gta gaa ccc<br>Leu Gly Pro Asp Pro Leu Leu Ala Arg His Leu Glu Glu Val Glu Pro<br>490 495 500     |     |     | 1584 |
| gag atg ccc tgt gtc ccc cag ctc tct gag cca acc act gtg ccc caa<br>Glu Met Pro Cys Val Pro Gln Leu Ser Glu Pro Thr Thr Val Pro Gln<br>505 510 515     |     |     | 1632 |
| cct gag cca gaa acc tgg gag cag atc ctc cgc cga aat gtc ctc cag<br>Pro Glu Pro Glu Thr Trp Glu Gln Ile Leu Arg Arg Asn Val Leu Gln<br>520 525 530 535 |     |     | 1680 |
| cat ggg gca gct gca gcc ccc gtc tgc gcc ccc acc agt ggc tat cag<br>His Gly Ala Ala Ala Ala Pro Val Ser Ala Pro Thr Ser Gly Tyr Gln<br>540 545 550     |     |     | 1728 |
| gag ttt gta cat gcg gtg gag cag ggt ggc acc cag gcc agt gcg gtg<br>Glu Phe Val His Ala Val Glu Gln Gly Gly Thr Gln Ala Ser Ala Val<br>555 560 565     |     |     | 1776 |
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| agc tcc cca gag cac ctg ggt ctg gag ccg ggg gaa aag gta gag gac<br>Ser Ser Pro Glu His Leu Gly Leu Glu Pro Gly Glu Lys Val Glu Asp<br>650 655 660     |     |     | 2064 |
| atg cca aag ccc cca ctt ccc cag gag cag gcc aca gac ccc ctt gtg<br>Met Pro Lys Pro Pro Leu Pro Gln Glu Gln Ala Thr Asp Pro Leu Val<br>665 670 675     |     |     | 2112 |
| gac agc ctg ggc agt ggc att gtc tac tca gcc ctt acc tgc cac ctg<br>Asp Ser Leu Gly Ser Gly Ile Val Tyr Ser Ala Leu Thr Cys His Leu<br>680 685 690 695 |     |     | 2160 |
| tgc ggc cac ctg aaa cag tgt cat ggc cag gag gat ggt ggc cag acc<br>Cys Gly His Leu Lys Gln Cys His Gly Gln Glu Asp Gly Gly Gln Thr<br>700 705 710     |     |     | 2208 |

|   |      |
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| Pro Val Met Ala Ser Pro Cys Cys Gly Cys Cys Cys Gly Asp Arg Ser |      |
| 715 720 725   |      |
| tcg ccc cct aca acc ccc ctg agg gcc cca gac ccc tct cca ggt ggg | 2304 |
| Ser Pro Pro Thr Thr Pro Leu Arg Ala Pro Asp Pro Ser Pro Gly Gly |      |
| 730 735 740   |      |
| gtt cca ctg gag gcc agt ctg tgt ccg gcc tcc ctg gca ccc tcg ggc | 2352 |
| Val Pro Leu Glu Ala Ser Leu Cys Pro Ala Ser Leu Ala Pro Ser Gly |      |
| 745 750 755   |      |
| atc tca gag aag agt aaa tcc tca tca tcc ttc cat cct gcc cct ggc | 2400 |
| Ile Ser Glu Lys Ser Lys Ser Ser Ser Ser Phe His Pro Ala Pro Gly |      |
| 760 765 770 775   |      |
| aat gct cag agc tca agc cag acc ccc aaa atc gtg aac ttt gtc tcc | 2448 |
| Asn Ala Gln Ser Ser Ser Gln Thr Pro Lys Ile Val Asn Phe Val Ser |      |
| 780 785 790   |      |
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| -5 -1 1 5   |      |
| Thr Cys Val Ser Asp Tyr Met Ser Ile Ser Thr Cys Glu Trp Lys Met |      |
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| Asn Gly Pro Thr Asn Cys Ser Thr Glu Leu Arg Leu Leu Tyr Gln Leu |      |
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| Val Phe Leu Leu Ser Glu Ala His Thr Cys Ile Pro Glu Asn Asn Gly |      |
| 40 45 50 55   |      |
| Gly Ala Gly Cys Val Cys His Leu Leu Met Asp Asp Val Val Ser Ala |      |
| 60 65 70  |      |

Asp Asn Tyr Thr Leu Asp Leu Trp Ala Gly Gln Gln Leu Leu Trp Lys  
75 80 85

Gly Ser Phe Lys Pro Ser Glu His Val Lys Pro Arg Ala Pro Gly Asn  
90 95 100

Leu Thr Val His Thr Asn Val Ser Asp Thr Leu Leu Leu Thr Trp Ser  
105 110 115

Asn Pro Tyr Pro Pro Asp Asn Tyr Leu Tyr Asn His Leu Thr Tyr Ala  
120 125 130 135

Val Asn Ile Trp Ser Glu Asn Asp Pro Ala Asp Phe Arg Ile Tyr Asn  
140 145 150

Val Thr Tyr Leu Glu Pro Ser Leu Arg Ile Ala Ala Ser Thr Leu Lys  
155 160 165

Ser Gly Ile Ser Tyr Arg Ala Arg Val Arg Ala Trp Ala Gln Cys Tyr  
170 175 180

Asn Thr Thr Trp Ser Glu Trp Ser Pro Ser Thr Lys Trp His Asn Ser  
185 190 195

Tyr Arg Glu Pro Phe Glu Gln His Leu Leu Leu Gly Val Ser Val Ser  
200 205 210 215

Cys Ile Val Ile Leu Ala Val Cys Leu Leu Cys Tyr Val Ser Ile Thr  
220 225 230

Lys Ile Lys Lys Glu Trp Trp Asp Gln Ile Pro Asn Pro Ala Arg Ser  
235 240 245

Arg Leu Val Ala Ile Ile Ile Gln Asp Ala Gln Gly Ser Gln Trp Glu  
250 255 260

Lys Arg Ser Arg Gly Gln Glu Pro Ala Lys Cys Pro His Trp Lys Asn  
265 270 275

Cys Leu Thr Lys Leu Leu Pro Cys Phe Leu Glu His Asn Met Lys Arg  
280 285 290 295

Asp Glu Asp Pro His Lys Ala Ala Lys Glu Met Pro Phe Gln Gly Ser

| 300 |     |     |     |     |     |     |     |     |     | 305 |     |     |     |     | 310 |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| Gly | Lys | Ser | Ala | Trp | Cys | Pro | Val | Glu | Ile | Ser | Lys | Thr | Val | Leu | Trp |  |  |  |  |
|     |     |     | 315 |     |     |     |     |     | 320 |     |     |     | 325 |     |     |  |  |  |  |
| Pro | Glu | Ser | Ile | Ser | Val | Val | Arg | Cys | Val | Glu | Leu | Phe | Glu | Ala | Pro |  |  |  |  |
|     |     | 330 |     |     |     |     |     | 335 |     |     |     | 340 |     |     |     |  |  |  |  |
| Val | Glu | Cys | Glu | Glu | Glu | Glu | Glu | Val | Glu | Glu | Glu | Lys | Gly | Ser | Phe |  |  |  |  |
|     | 345 |     |     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |  |  |  |  |
| Cys | Ala | Ser | Pro | Glu | Ser | Ser | Arg | Asp | Asp | Phe | Gln | Glu | Gly | Arg | Glu |  |  |  |  |
| 360 |     |     |     |     |     | 365 |     |     |     | 370 |     |     |     |     | 375 |  |  |  |  |
| Gly | Ile | Val | Ala | Arg | Leu | Thr | Glu | Ser | Leu | Phe | Leu | Asp | Leu | Leu | Gly |  |  |  |  |
|     |     |     | 380 |     |     |     |     |     | 385 |     |     |     |     |     | 390 |  |  |  |  |
| Glu | Glu | Asn | Gly | Gly | Phe | Cys | Gln | Gln | Asp | Met | Gly | Glu | Ser | Cys | Leu |  |  |  |  |
|     |     | 395 |     |     |     |     |     | 400 |     |     |     |     |     | 405 |     |  |  |  |  |
| Leu | Pro | Pro | Ser | Gly | Ser | Thr | Ser | Ala | His | Met | Pro | Trp | Asp | Glu | Phe |  |  |  |  |
|     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |     |     |     |  |  |  |  |
| Pro | Ser | Ala | Gly | Pro | Lys | Glu | Ala | Pro | Pro | Trp | Gly | Lys | Glu | Gln | Pro |  |  |  |  |
|     |     | 425 |     |     |     |     | 430 |     |     |     | 435 |     |     |     |     |  |  |  |  |
| Leu | His | Leu | Glu | Pro | Ser | Pro | Pro | Ala | Ser | Pro | Thr | Gln | Ser | Pro | Asp |  |  |  |  |
| 440 |     |     |     |     |     | 445 |     |     |     | 450 |     |     |     |     | 455 |  |  |  |  |
| Asn | Leu | Thr | Cys | Thr | Glu | Thr | Pro | Leu | Val | Ile | Ala | Gly | Asn | Pro | Ala |  |  |  |  |
|     |     |     | 460 |     |     |     |     |     | 465 |     |     |     |     | 470 |     |  |  |  |  |
| Tyr | Arg | Ser | Phe | Ser | Asn | Ser | Leu | Ser | Gln | Ser | Pro | Cys | Pro | Arg | Glu |  |  |  |  |
|     |     |     | 475 |     |     |     |     | 480 |     |     |     |     | 485 |     |     |  |  |  |  |
| Leu | Gly | Pro | Asp | Pro | Leu | Leu | Ala | Arg | His | Leu | Glu | Glu | Val | Glu | Pro |  |  |  |  |
|     |     | 490 |     |     |     |     | 495 |     |     |     |     | 500 |     |     |     |  |  |  |  |
| Glu | Met | Pro | Cys | Val | Pro | Gln | Leu | Ser | Glu | Pro | Thr | Thr | Val | Pro | Gln |  |  |  |  |
|     | 505 |     |     |     |     |     | 510 |     |     |     | 515 |     |     |     |     |  |  |  |  |
| Pro | Glu | Pro | Glu | Thr | Trp | Glu | Gln | Ile | Leu | Arg | Arg | Asn | Val | Leu | Gln |  |  |  |  |
| 520 |     |     |     |     | 525 |     |     |     |     | 530 |     |     |     |     | 535 |  |  |  |  |





Ile Ser Glu Lys Ser Lys Ser Ser Ser Ser Phe His Pro Ala Pro Gly  
760 765 770 775

Asn Ala Gln Ser Ser Ser Gln Thr Pro Lys Ile Val Asn Phe Val Ser  
780 785 790

Val Gly Pro Thr Tyr Met Arg Val Ser  
795 800